

**REMEDATION DIVISION
IN SITU PEER REVIEW TEAM
APPROVAL & TRACKING FORM**

In Situ Peer Review Date: 4/4/2017

Accounting Code:

Site Name: RACER Flint West

Address: Stevens and Glennwood Streets, Flint

County: Genesee

ID: (Select) **Not Ranked**

Release #:

Project Manager / Presenter: Jim Innes

District Peer Review Completed: Yes ☐ No ☒

Full Scale Plan ☐ **Pilot Study** ☒

Type of Injection: Hydrogen Release Compound

Purpose of Presentation (Question(s) before In Situ Peer Review):

Determine if enough information is present and, if so, is the proposal approvable

Attachments & Reports Used in Developing the Conclusions and/or Recommendations:

Work Plan

Cross Sections and Groundwater Contour

Site History / Details:

The Site consists of approximately five acres of land located west of Stevens Street and north of Glenwood Avenue in Flint, Genesee County, Michigan. The Site is developed with a Consumers Energy electrical substation in the central portion. Almost the entire Site consists of concrete pavement, remaining after the demolition of a former manufacturing building. The concrete pavement is supported by a concrete retaining wall that runs east-west and immediately south of the northern property line. A small area on the north portion of the property is unpaved and part of a former railroad. The majority of the Site is secured with a locked chain-link fence.

A railroad grade runs along the northern property boundary, beyond which is located the Chevy-in the-Hole property. Former industrial land is located to the east, across Stevens Street and to the west. Current and former commercial uses are located to the southwest and south. A General Motors tool and die facility is located to the southeast.

Subsurface materials consist of glacial tills in the upper approximately 20 feet to 30 feet below grade with shallow groundwater perched on a clay layer. (Note that site topography varies approximately 8 feet to 10 feet due to the retaining wall.) The saturated thickness above the clay ranges from about 10 feet to 15 feet, and groundwater flow in this unit is generally to the north/northwest toward the Flint River. Bedrock was encountered at approximately 20 feet below a clay layer on the north portion of the Site.

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The primary constituent of concern is trichloroethene and it appears to be present from historic releases. No significant trichloroethene source mass was found in unsaturated soils. The highest remaining concentrations of trichloroethene are in the saturated unit and underlying clay in the north portion of the Site and the immediately adjacent abandoned railroad property.

The plan is to inject HRC into the saturated soils in the general locations shown on Figure 1 of the workplan, beginning at the terminus at bedrock and pulled up to an elevation ~15 feet below grade. The plan is summarized here (page 5 of the workplan).

Applied By:	Direct push and grout pump
Application Rate:	10 pounds per vertical foot
Application Interval (vertical):	5 feet. Approximately 15-20' below grade
Application Interval (horizontal):	5-foot spacing (six injection points in each of four areas)
Application Area:	Four areas, approximately five by 10 feet each
Number of Application Points:	24
Pounds of HRC:	1,200

The monitoring plan is to take a round of groundwater samples 1 month prior, 1 month following, 3 months following, and 6 months following for:

Geochemistry data, including pH, oxidation reduction potential, dissolved oxygen, and conductivity, will be collected from groundwater from the above identified wells [MWs 113S and 109S]. Samples will be analyzed for volatile organic compounds (VOCs) and the following metals (total and dissolved): arsenic, chromium (total and hexavalent), copper, lead, selenium, and zinc, in order to identify contaminant reduction trends and potential solubilizing of metals into the groundwater.

Approximately six months after the injection, 2 soil samples will be taken from a boring near SB-122/133 and 2 soil samples from a boring near SB-123/131/132. Field screening will determine the two samples per boring that are analyzed for VOCs.

In Situ Peer Review Conclusions, Reasoning, and Follow-up Recommendations:

The Corrective Measures Study states the objective for the site is to protect the human health and the environment by achieving industrial/commercial closure (DEQ non-residential). Why inject at all if the drinking water pathway is controlled with an RC and the GSI pathway is not complete?

Although not specifically mentioned, the standard operating procedure for low flow sampling includes turbidity. Along with turbidity, Total Organic Carbon, Iron, Manganese, and methane should be included in the groundwater analytical.

From the groundwater contour, an additional groundwater monitoring well should be installed near SB-137 and screened to monitor the injection.

The workplan should include a contingency plan.

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There is no indication of the expected radius of influence so the plan (amount of HRC per injection point, arrangement of injection points, non-grid layout) appears to be arbitrary. Why four areas and not a single area?

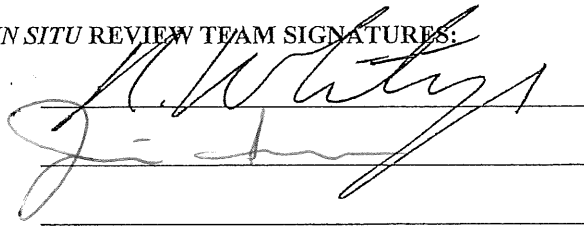
HRC needs to come into contact with contaminants in order to work. Was a recirculation (inject-extract) gallery considered to maximize contact?

The plan does not contain aquifer parameters that are necessary to estimate travel time from the injection point to the monitoring wells. This product can persist for 5 years in the saturated zone so a long-term sampling plan needs to include the time it will take the product to travel from the injection to the monitoring point.

As noted above, the persistence of this product requires a sampling plan for more than 6 months. The sampling plan should be annual at a minimum to start, but language indicating an intent to 'review and adjust' after a set number of sampling events is appropriate.

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IN SITU REVIEW TEAM SIGNATURES:



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